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REMARKS**INTRODUCTION:**

In accordance with the foregoing, claims 4 and 13 have been canceled, claims 1, 5, 9, 21, 22, 24, and 26 have been amended, and claim 28 has been added. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-3, 5, 7-9, and 11, 12, and 14-28 are pending and under consideration.

CLAIM OBJECTIONS

In the Office Action, at page 2, the Examiner objected to claims 5, 13-15, and 19. The reasons for the objection are set forth in the Office Action and therefore not repeated.

Regarding claim 5, the claimed range refers to the predetermined distance between the second paper sensor and the printer head, both of which are mounted to the carrier, which is movable.

Regarding claim 13, the subject matter of which has been incorporated into independent claim 9, and claim 19, the second paper sensor, not the first paper sensor, is transversely moved, and the position is tracked.

Regarding claims 14 and 15, the respective preambles recited that the second paper sensor and the printer head are mounted to a movable carrier, not the first paper sensor.

Accordingly, Applicant respectfully submits that the Examiner's rejections are overcome.

REJECTION UNDER 35 U.S.C. §102:

In the Office Action, at page 3, the Examiner rejected claims 1-4, 7-9, 11-16, 20-22, 24, 26, and 27 under 35 U.S.C. §102(a) and (e) as being anticipated by Tung et al., (US 6,435,641 – hereinafter Tung). The reasons for the rejection are set forth in the Office Action and therefore not repeated. Applicant traverses this rejection and respectfully requests reconsideration.

Claims 4 and 13 have been cancelled.

The MPEP states: "[t]o anticipate a claim, the reference must teach every element of the claim." (MPEP 2131).

The MPEP then quotes: "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art

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reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). (Quoted in MPEP 2131).

Amended, independent claim 1 recites: "...a second paper sensor mounted to the carrier a predetermined distance from the printer head, to detect a right edge, a left edge, the top edge, and the bottom edge of the paper; and a controller controlling operations of the printer head to control print margins of top and bottom ends of the paper by comparing first top edge and first bottom edge signals from the first paper sensor and second top edge and second bottom edge signals from the second paper sensor, and to control print margins of right and left edges of the paper according to left and right edge detections signals of the second paper sensor."

Amended, independent claim 9 recites: "...detecting a left edge or a right edge of the sheet of paper when the second paper sensor moves transversely to at least one of the left edge or the right edge of the sheet of paper, and generating a begin print command at a later of the start print time interval and the second top edge detection signal, and generating an end print command at a later of the end print time interval and the second bottom edge detection signal."

Amended, independent claim 24 recites: "...a second paper sensor connected with the carrier, to detect a right edge, a left edge, the top edge, and the bottom edge of the paper; and a controller, using right and left edge signals from the second paper sensor and comparing first top edge and first bottom edge signals from the first paper sensor and second top edge and second bottom edge signals from the second paper sensor, to control the printer head to start and stop printing on the paper."

Amended, independent claim 26 recites: "...a second paper sensor mounted to the carrier a predetermined distance from the printer head and detecting the top edge, the bottom edge, and left and right edges of the paper; and a controller controlling operations of the printer head according to a comparison of signals from the first and second paper sensors...."

And independent claim 27 recites: "...detecting a top edge, a bottom edge, and at least one of left or right edges of the sheet of paper using the second paper sensor, to output a corresponding second top edge detection signal, a second bottom edge detection signal, and at least one of left or right edge detection signals; estimating a start print time based on the first top edge detection signal and generating a begin print command at a later of the estimated start print time and the second top edge detection signal; estimating an end print time based on the first bottom edge detection signal and generating an end print command at a later of the estimated end print time and the second bottom edge detection signal; and generating at least

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one of left or right edge print commands when the at least one of the left or right edges is detected."

While the device disclosed in Tung has both a media sensor 328 and an optical sensor 330, in the first of the two disclosed printing modes, the optical sensor 330 is not even employed. (See Tung, at col. 6, line 39 – col. 7, line 12).

In the second disclosed printing mode, in which three or more sheets are printed, the media sensor 328 is employed to determine a leading edge of a first unit of paper 12 and a trailing edge of the first unit of paper 12, to position the leading edge for printing, and to determine a length of the first unit of paper 12. (See Tung, at col. 8, lines 36-47, and col. 9, lines 18-27).

In the second printing mode, the media sensor 328 is also employed to determine a leading edge of a second unit of paper 12. Tung goes so far as to state that the media sensor 328 is not employed to determine a trailing edge of the second unit of paper, "...because media sensor 328 cannot be relied upon to sense the trailing edge of the second unit of paper 12 in the second mode of operation." (Tung, col. 9, lines 64-66).

Instead, the "...processor 320 determines (by looking at counts from rotary position encoder 316) if the trailing edge of the second unit of paper 12 reaches the nip region between the pinch rollers using the count of rotary position encoder 316 obtained from media movement controller 318 at the detection of the leading edge of the second unit of paper 12, the length of the second unit of paper 12, and the known distance from lever 332 of media sensor 328 to the nip region." (Tung, col. 10, lines 39-47).

The device disclosed in Tung then employs the optical sensor 330 to determine a leading edge of a third unit of paper 12 (and presumably the leading edges of any additional units of paper 12). (See Tung, at col. 11, line 23 – col. 12, line 16).

Regarding detecting a trailing edge of the third unit of paper, Tung appears to suggest that the media sensor 328 is employed, since the once the trailing edge is determined, the processor 320 commands media movement controller 318 to move the trailing edge of the third unit of paper to the nip region between the pinch rollers (see Tung, at col. 14, lines 12-21), and the trailing edge would not yet have passed nip region between the pinch rollers if it were detected by the media sensor 328.

Thus, Tung appears to suggest that while the media sensor 328 is used to detect leading and trailing edges, the optical sensor is only used to detect leading edges of units of paper.

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In the description of the two modes of operation of Tung's device (col. 6, line 39 – col. 14, line 27), each time the processor 320 tries to determine a leading or trailing edge of a unit of paper and polls the sensor controller 336, output from only one of the two sensors is obtained.

Further, regardless of operational mode, the controller 320 never compares input from the media sensor 328 with input from the optical sensor 330, for any unit of paper 12.

Further still, there is no suggestion in Tung to compare outputs from different sensors, nor any suggestion to even use output from more than one sensor to determine a given leading or trailing edge. Describing polling of the sensor controller 336 in the first operational mode, to determine a leading edge, Tung states: “[p]olling every 1.6 ms has been found to locate the leading edge with sufficient accuracy.” (Tung, col. 6, lines 52-54). And describing the second operational mode, Tung states:

“[t]he gap between successive units of paper 12 while operating in the second mode will be, in many cases, too small to permit the trailing edge of the earlier unit of paper 12 or the leading edge of the later unit of paper 12 to be detected by media sensor 328 because lever 332 will not rotate sufficiently in the gap between units of paper 12 to generate a change in the signal supplied to sensor controller 336. Therefore, for imaging operations performed in the second mode, the trailing edge and the leading edge of units of paper 12 will be detected in a different way.” (Tung, col. 7, lines 32-42).

Applicant respectfully submits that Tung teaches away from comparing outputs from different sensors, or using output from more than one sensor to determine a given leading or trailing edge.

In responding to Applicant's previous arguments, the Examiner correctly notes that Tung states: “[u]nder firmware control, processor 320 polls sensor controller 336 to determine the state of the sensors.” But in the description of the two modes of operation of Tung's device (col. 6, line 39 – col. 14, line 27), each time the processor 320 tries to determine a leading or trailing edge of a unit of paper and polls the sensor controller 336, output from only one of the two sensors is obtained. Thus, Tung neither discloses nor suggests that the processor 320 polls sensor controller 336 to determine the state of more than one sensor at a time, or even to determine the state of more than one sensor for a given leading or trailing edge.

Then, the Examiner asserts that “[t]he controllers (*sic*), which has a function of comparing the signals from the sensors for operating the feeding of substrates, are inherent in Tung, et al. so that the device can be operated.”

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Applicant respectfully disagrees. Operation of the device in Tung is described without referencing any comparison of signals. Applicant respectfully submits that there is no indication in Tung that signals from the media sensor 328 are ever compared with signals from the optical sensor 330. If the Examiner continues to maintain this assertion, the Examiner is respectfully requested to specifically point out what portion of Tung discloses or suggests this inherency. To the extent that the Examiner's assertion is based on personal knowledge, Applicant respectfully requests that the Examiner submit an affidavit detailing such personal knowledge.

Yet further still, Tung neither discloses nor suggests detecting right or left edges of any unit of paper, with any sensor.

In contrast, the claimed invention detects top, bottom, and at least one of right or left edges of paper to control the print margin.

Applicant respectfully submits that Tung neither discloses nor suggests every element of the claims, arranged as required by the claims.

Accordingly, Applicant respectfully submits that the Examiner has not provided sufficient evidence to maintain a prima facie anticipation rejection of the claims 1-3, 7-9, 11, 12, 14-16, 20-22, 24, 26, and 27.

Accordingly, Applicant respectfully submits that independent claims 1, 9, 24, 26, and 27 patentably distinguish over the cited art, and should be allowable for at least the above-mentioned reasons. Further, Applicant respectfully submits that claims 2, 3, 7, 8, 11-16, and 20-22, which ultimately depend from one of independent claims 1 or 9, should be allowable for at least the same reasons as claims 1 and 9, as well as for the additional features recited therein.

REJECTION UNDER 35 U.S.C. §103:

In the Office Action, at page 4, the Examiner rejected claims 5, 17-19, 23, and 25 under 35 U.S.C. §103(a) as being unpatentable over Tung. The reasons for the rejection are set forth in the Office Action and therefore not repeated. Applicant traverses this rejection and respectfully requests reconsideration.

Applicant respectfully submits that claims 5, 17-19, 23, and 25, which ultimately depend from one of independent claims 1, 9, or 24 should be allowable for at least the same reasons as claims 1, 9, and 24, as well as for the additional features recited therein.

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CONCLUSION:


In accordance with the foregoing, Applicant respectfully submits that all outstanding objections and rejections have been overcome and/or rendered moot, and further, that all pending claims patentably distinguish over the cited art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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